IN THE FIGURES:

Fig. 1 is amended to separately label Figure 1a and Figure lb. and to indicate that the figure shows "Prior Art".

Fig. 5 has been amended to show the reference number "50".

Replacement sheets are attached to this amendment.

REMARKS

Status of the Claims

Claims 1-11 were previously pending. New claims 12 and 13 are added.

Applicants appreciate the indication of allowability (if amended to independent form) of claims 5-8. Claims 5, 7 and 8 are amended to independent form. Claim 6 depends from claim 5. Indication of allowance of claims 5-8 is respectfully requested.

Claim 1 is amended to recite that the means for acoustic resonance matching is made of a material which has the acoustic impedance of air, which material is placed in two dimensions and contiguously over the at least one sound emergence location. Support can be found in paragraph [0009] of the specification as filed "The sealing of the end of the tube with material which has a value of approximately 40 rayl simulates a tube of infinite length and thus results in ideal resonance-free emergence of sound."

Support for new claim 12 can be found in paragraph [0009], last sentence "In particularly advantageous fashion, the thickness of the felt metal used should be in the order of magnitude of 1 mm, so that there is firstly adequate shock and compression resistance and secondly the lowest possible damping of the sound waves which are to be transmitted."

Support for new claim 13 can be found in paragraph [00012].

Office Action

Specification

The Abstract is objected to because it contains narrative language and should be limited to 50 to 150 words.

In response, the Abstract has been amended

The disclosure is objected to - Applicant should be consistent in naming element "50".

In response, paragraph [00017] as filed (paragraph [0029] as published) has been amended to delete first (incorrect) reference number 50.

Claim Objections

Claim 5 is objected to - Claim 5 depends from itself and should apparently depend from claim 4.

In response, Applicants acknowledge that the Examiner's is correct. Accordingly, in amending claim 5 to independent form, Applicants incorporate claims 1, 3 and 4 into claim 5.

Drawings

The drawings are objected to because:

Fig. 1 is not labelled as Fig. 1a and Fig. 1b as described in the specification in paragraph [00011] as filed;

Fig. 1 should be designated by a legend such as --Prior Art-- ; and

Fig. 5 is missing reference number "50" indicating loudspeaker chassis is missing from.

In response, two replacement sheets correcting the above deficiencies are submitted herewith, labelled in the top margin as "Replacement Sheet".

Claim Rejections - 35 USC § 103

Claims 1, 9 and 10 are rejected under 35 U.S.C. 103(a) as being obvious over Maekawa et al. U.S. Patent No. 7,130,440 B2 in view of Tsukamoto U.S. Patent No. 3,944,757.

The Examiner considers Maekawa to disclose the present invention except for

- at least one sound emergence location provided with a means for achieving acoustic impedance matching for the air in the sound channel and the ambient air in order to reduce resonance effects, and
- the means for acoustic resonance matching is made of *a material which has the acoustic impedance of air*,

- wherein this material is placed in *two dimensions* and contiguously over the at least one sound emergence location.

Tsukamoto is relied on for teaching that which is missing fromMaekawa et al.

Applicants respectfully traverse.

A major object of the present invention is to provide an acoustic apparatus which has the best possible matching for the acoustic impedance between the air column produced by a sound transducer and the ambient air. This object is achieved by virtue of the inventive refinement of an acoustic apparatus for producing audio signals, in which

(a) the sound transducer and at least one sound emergence location are physically separate from one another,

(b) an air-guiding sound channel connects the sound emergence location to the means for achieving acoustic impedance matching for the air in the sound channel and the ambient air in order to reduce resonance effects, and

(c) the means for acoustic resonance matching is made of a material which has the acoustic impedance of air, and is placed in two dimensions and contiguously over the at least one sound emergence opening. This advantageously achieves acoustic impedance matching which not only requires the smallest possible physical space but also provides protection from the entry of dirt into the apparatus at the same time.

As disclosed in paragraph [0009] of the application as filed, the material according to the present invention should have the lowest possible damping of the sound waves which are to be transmitted (and reflected in the independent claim limitations "acoustic impedance of air"), and preferably have a thickness in the order of 1 mm (claim 12). Preferred materials for use in the present invention are set forth in the specification and characteristics of these materials can be found, e.g., on the internet at
http://www.techneticsfl.com/What%20is%20Feltmetal.html and
http://www.techneticsfl.com/Resources.html).

Tsukamoto teaches at col. 3, line 30: "The length of the tubular member is selected to be sufficiently longer than the longest wavelength of a sound belonging to the desired

frequency range, and means for reducing the creation of a standing wave is further provided therein. The means for reducing the standing wave may comprise an **acoustic resistance imparting body made of a sound absorbing substance**, an acoustic impedance matching member such as a horn provided at an end of the tubular member, or slit means also provided at the end of the tubular member."

Further, while the tube of the present invention is preferably 1 meter or less (claim 13), the sound absorbing conical body by itself illustrated in Tsukamoto is itself 4.25 meters long.

More specifically, according to Tsukamoto (col. 4 line 8 – col. 5 line 39):

> It is widely known that the reflection of a sound from a surface can be eliminated by the provision of a conical sound absorbing body of a length, $\lambda/4$ (wherein, λ is the wavelength of the sound). Since the wavelength λ corresponding to a frequency 20 c/s of a sound is 17 m, $\lambda/4 = 4.25$ m. Thus, a tubular member including **a sound-absorbing conical body** having a **length 4.25 m** and a diameter of several centimeters can be bent around with a radius of curvature several times greater them the cross-sectional diameter of the tubular member without affecting the acoustic characteristic thereof, and for this reason, the loudspeaker according to the present invention can be applied to various acoustic equipment for domestic use.
>
> ...
>
> Acoustic tubes having lengths of several meters have been used for a long time for the transmission of sound or as an acoustic resistance. However, such tubes have not been used extensively for directly radiating a sound to the outer atmosphere particularly in the cases where the sound is heard at a position separated from the loudspeaker by several meters. The reason for this is that the acoustic tube suffers from **various drawbacks** which are considered as being almost total. **The most serious of the drawbacks is in the difficulty in matching between the acoustic impedance within the acoustic tube and that of the outer atmosphere**, and if the impedance matching is not sufficient, standing waves are created in the acoustic tube at frequencies which are 1/2, 1, 2, 3, - - - times the wavelengths thereof corresponding to the length of the acoustic tube, **whereby the reproduction of sound waves at high fidelity becomes utterly hopeless**.
>
> ...

> According to the invention, **various measures are provided for preventing the reflection of sound waves at the ends of the acoustic tube and for eliminating the creation of standing waves**, so that the above described drawbacks of the acoustic tube can be eliminated. Thus, when a loss in reproduction of sound of an order of several percent is allowed, the acoustic tube with the remaining percentage of sound can still radiate a far more powerful sound with high fidelity than that of the conventional direct radiating type loudspeakers.
>
> ...
>
> Referring to FIG. 1, there is indicated a basic example of a moving-coil loudspeaker according to the present invention. The loudspeaker plurality a diaphragm 1 driven by a moving coil 2 which in turn is arranged in a d.c. magnetic field established by a magnetizing device (not shown). The diaphragm 1 is connected through an annular coupling member 4a with an end of a tubular member 3 which has a uniform cross-sectional area S along its longitudinal axis, so that a front chamber 4b is defined by the diaphragm 1, the annular coupling member 4a, and the end portion of the tubular member 3. **In the forward part of the tubular member 3, an acoustic resistance member 5 made of a sound-absorbing material and formed into a conical configuration is inserted.** A conical horn 6 having an opening angle of 90° is connected to the forward end of the tubular member 3 for providing an acoustical matching between the air column within the tubular member 3 and the outer atmosphere. The horn 6 is provided at the peripheral edge thereof with a baffle 7 lying in the plane of the opening of the conical horn.

Accordingly, Tsukamoto does not teach what is missing from Maekawa to reach the present invention, namely,

- at least one sound emergence location provided with a means for achieving acoustic impedance matching for the air in the sound channel and the ambient air in order to reduce resonance effects,
- the means for acoustic resonance matching is made of *a material which has the acoustic impedance of air*,
- wherein this material is placed in *two dimensions* and contiguously over the at least one sound emergence location.

Next, claim 9 is rejected as obvious over the combination of Maekawa in view of Tsukamoto.

Applicants submit that this dependent claim is allowable by virtue of its dependence from an allowable base claim.

Claim 10 is rejected as obvious over the combination of Maekawa in view of Tsukamoto.

Applicants submit that this dependent claim is allowable by virtue of its dependence from an allowable base claim.

Claims 2 and ll are rejected as obvious over the combination of Maekawa in view of Tsukamoto as applied to claim 1 above, and further in view of Kohn U.S. Patent No. 5,248,846.

Applicants submit that this dependent claim is allowable by virtue of its dependence from an allowable base claim.

Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being obvoius over the combination of Maekawa in view of Tsukamoto as applied to claim 1 above, and further in view of Rosen et al.U.S. Patent No. 5,170,435.

Applicants submit that this dependent claim is allowable by virtue of its dependence from an allowable base claim.

Allowable Subject Matter

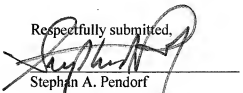
Claims 5-8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Applicants appreciate the indication of allowability (if amended to independent form) of claims 5-8. Claims 5, 7 and 8 are amended to independent form. Claim 6 depends from claim 5. Indication of allowance of claims 5-8 is respectfully requested.

The Commissioner is hereby authorized to charge any fees which may be required at any time during the prosecution of this application without specific authorization, or credit any overpayment, to Deposit Account Number 16-0877.

Should further issues remain prior to allowance, the Examiner is respectfully requested to contact the undersigned at the indicated telephone number.

Respectfully submitted,



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